PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY

MEETING OF DECEMBER 6, 1932

A regular meeting of the Society was held on December 6, 1932, in the American Museum of Natural History; Vice-president Bell in the chair, with twenty-five members and thirteen visitors present.

The Program Committee announced that, at the next meeting, Dr. Melander would speak on "Insect Embryology" and that Dr. Leonard would speak on "Recent Entomological Developments in Porto Rico."

Dr. Ruckes delivered the second part of his paper on "The Mouth Parts of Insects." The following abstract of his paper, delivered at the meetings on Nov. 15 and Dec. 6, was furnished by Dr. Ruckes.

Abstract of Dr. Herbert Ruckes' Paper

MOUTH PARTS OF INSECTS, PART I

Developmental Aspects. The principal workers on this subject have been: Cholodkovsky; Kowalevsky; Nusbaum; Grabe; Tischmiroff; Carriere; Heymons; Wiesmann; Patten; Wheeler.

The general accepted plan is, that insects are constructed in 18 segments; the head constitutes not less than six. These are known respectively as the cephalic segments, consisting of three metameres; the mandibular; the first maxillary; and the second maxillary. The identification and designation of the various mouth parts is obscured by the fact that in almost all instances, extensive coalescence of the above-mentioned six segments takes place.

The finer analysis of the segmentation of the head is based upon the arrangement of the appendages and the finer structure of the brain. Under the latter heading we can recognize:

(1) The proto-cerebrum, which locates the pro-stomial region and the pre-antennal segment.
(2) The duto-cerebrum, which limits the pre-antennal segment, and
(3) The trito-cerebrum, which locates the mandibular segment.

Heymons recognized the following; an unsegmented preoral region and six postoral segments: (1) the pre-antennal segment; (2) the antennal segment (the first antennæ of crustacea); (3) the post-antennal part (the second antennæ of crustacea); (4) the mandibular segment; (5) the first maxillary segment; and (6) the second maxillary segment.

In homologizing the mouth parts of insects with other arthropods, we can recognize:

(a) the labium, equivalent to the pro-stomium
(b) pre-antennal segment, equivalent to the eyestalks of crustacea
(c) antennæ, equivalent to the first antennae, or antennules of crustacea
(d) the post-antennal segment (almost invariably absent, or at the most vestigial), equivalent to the second antennæ of crustacea
(e) the mandibular segment, equivalent to the mandibules of crustacea
(f) the maxillary segment, equivalent to the first maxillæ
(g) the labium, equivalent to the second maxillæ

The fundamental plan of the insect mouth parts was explained, and its various parts homologized with the corresponding parts of the crustacean mouth parts.

Abstract of Dr. Herbert Ruckes' Paper

MOUTH PARTS OF INSECTS, PART II

Evolutionary Trends in the Mouth Parts: The orthopteroid type is considered primitive and generalized; a relatively broad labrum, chewing type of mandibles, maxillæ with a full complement of parts and five jointed palps and a labium of full development and three jointed palps.

Tendencies of the Labrum: This as well as other parts illustrates the principles of evolution by either addition (aggrandizement) or reduction. The labrum is proportionately bigger in larval lepidoptera and larval and adult odonata. The labrum is reduced in the adult lepidoptera, neuroptera and hymenoptera. In the diptera it is changed considerably in shape, being usually much elongated and stylet-like.

Tendencies of the Mandibles: They become greatly enlarged in certain species of coleoptera, in the Formicidæ, Odonata, termites and larval neuroptera (Myrmelionidæ). They show marked reduction in the adult lepidoptera, trichoptera, and ephemeridæ. They become extremely elongated in the hemiptera and diptera.

Tendencies in the Maxillæ: These show relatively little enlargement in any orders of insects, for the most part the evolution is one of reduction or of change in shape. Reduced maxillæ are found in the trichoptera and ephemeridæ and become greatly elongated in the diptera, lepidoptera and hemiptera.

Tendencies in the Labium: This organ shows least modification of any of the mouth parts. It reaches its greatest degree of modification in the diptera and hemiptera where it is much elongated and forms a casing for the other stylet-like mouth parts or forms the sucking and lapping apparatus in the diptera.

On the whole, the mouth parts of insects are plastic enough to evolve into forms that best meet the food-getting requirements of the species. The orthopteroid plan is best suited as a foundation from which the various lines of evolution might take place. Mouth parts of various orders of insects might be homologized if time permitted.

Dr. E. P. Felt gave a historical account of "The Development of Insect Control on Shade Trees" from the time of Harris, when whale oil solution and tar bands were used, and when it was recommended that corn be spread around under trees to attract swine which would destroy caterpillars by trampling upon them and eating them. Present control methods are largely the result of the campaign waged since 1890 against the Gypsy Moth. He emphasized the great value of the discovery of arsenate of lead as an effective agent of control, obviating leaf injury. He described in some detail the scouting method used to uncover new infestations, including the means by which the operations of the various agents were checked up. He said that eventually the use of traps might prove to be a more economical method of locating new infestations and that dusting from *aeroplanes* would no doubt be used more and more for control purposes. The outbreak at Pittston, Penna., of a Gypsy Moth infestation during the season of 1932 was mentioned as a serious threat of a further spread of this insect.

Commerce has introduced some fifty or more species of insects which

attack shade trees besides our own native pests. Some fifteen foreign insect parasites have been successfully established in this country in the Gypsy Moth campaign. Large areas of a single species of trees are especially subject to insect attack, but vigorous and healthy trees resist such attacks quite successfully.

Illustrating the present attention paid to the problem of the care of shade trees, Dr. Felt mentioned that Connecticut in 1932 had 164 Tree Wardens and Rhode Island 37, and that there are 136 Shade Tree Commissions in the State of New Jersey, and in various states several commercial organizations are engaged in this work.

Dr. C. T. Brues, of Cambridge, said that he was especially glad to attend a meeting of the New York Society as the first meeting of any entomological society he ever attended was of this same society.

JOHN D. SHERMAN, JR.,
Secretary Pro-tempore

MEETING OF DECEMBER 20, 1932

A regular meeting of the Society was held on December 20, 1932, at the American Museum of Natural History at 8:15 P.M.; Vice-president Bell was in the chair, with twenty-four members and twenty-three visitors present.

The Program Committee announced that the Annual Meeting of the Society would be held on January 3rd, 1933.

The following resignations were accepted, with regrets, on the part of the Society: Christian E. Nielson, and W. R. Walton, of Washington, D. C.

Mr. Davis spoke briefly on the death of Dr. W. J. Holland, who was a beloved member of the Society, a great executive, and who had helped many little societies by means of the Carnegie Fund. It was the unanimous wish of the members present that the Secretary write a note of sympathy to Mrs. Holland expressing the regret of the Society in the passing of one of their members.

The Nominating Committee, consisting of Messrs. Horsfall, Safro, and Sherman, was asked to report at the next meeting of the Society.

It was announced that in the future a period not to exceed fifteen minutes, under Miscellaneous Business, would be a part of the program in order to give members an opportunity of exhibiting specimens, etc.

Dr. Melander gave the third paper in the series on the Biology of Insects. Speaking on "Insect Embryology," he illustrated his remarks with lantern slides showing the mysterious phenomenon of the unfolding embryo.

Dr. Leonard then gave an interesting review of the "Entomological Developments in Porto Rico." He spoke first of the Fourth International Congress of Sugar Cane Technologists, which was held in Porto Rico in 1932 and attended by forty-five foreign delegates, the largest group of entomologists ever in Porto Rico. Dr. Pemberton, of Honolulu, was the Chairman. The Proceedings of the whole Congress are to be published in a few months. One of the most interesting papers presented was that on

the giant toad, *Bufa marinus,* which is bred very easily, found as high as 6,000 feet above the sea, and whose food consists largely (55%) of insects injurious to agriculture. These toads have been transported successfully from the United States to Honolulu, packed in moistened sawdust, forty toads in a box. They have arrived at their destination, hungry and shrunken, but otherwise none the worse for their three weeks' trip. In Honolulu, they were used to protect the sugar-cane and also ornamentals.

Dr. Leonard said that the cottony cushion scale, the insect that nearly ruined the citrus in California in the seventies, was discovered in Porto Rico for the first time in April, 1932. Through the rapid cooperation of the Florida State Plant Board, Australian lady beetles were received in Porto Rico a week after the infestation of the scale was discovered. By July, the two original infestations and others had been greatly reduced. Later on in the summer, a hurricane finished the job by destroying much of the citrus of Porto Rico. Dr. Leonard concluded his remarks by showing a slide of a group of some of the entomologists present at the Congress of Sugar Cane Technologists.

Dr. Reginald Painter, of the Kansas State College of Agriculture and Applied Science in Manhattan, said he was very happy to attend a meeting of the Society on his trip through the east, where he was studying Bombyliidæ types in the various museums. His particular field is the study of the resistance of plants to insect attack. He extended a cordial invitation to the members of the Society to visit the Kansas Entomological Society, which publishes the only entomological journal between the Atlantic coast and the Pacific coast.

Dr. Paul E. Hering, of Cornell University, expressed his pleasure in being present at a meeting of the Society.

ELIZABETH SHERMAN, *Secretary*

MEETING OF JANUARY 3, 1933

The annual meeting of the Society was held on January 3, 1933, in the American Museum of Natural History; Vice-president Ernest L. Bell in the chair, with twenty members and twenty visitors present.

The Nominating Committee read its report. It was moved and seconded that the Secretary cast a ballot electing the officers and committees nominated in this report, as follows:

President: Ernest L. Bell
Vice-president: A. L. Melander
Secretary: Miss Elizabeth Sherman
Treasurer: G. C. Hall

Executive Committee: Henry Bird
Wm. T. Davis
F. E. Lutz
Herbert Ruckes
H. F. Schwartz

Publication Committee:	H. B. Weiss C. W. Leng John D. Sherman, Jr. C. E. Olsen
Auditing Committee:	E. T. Huntington H. F. Schwartz E. R. P. Janvrin
Curator:	A. J. Mutchler
Librarian:	F. E. Watson

The following committees were appointed:

Field Committee:	Herman Moennich
Program Committee:	C. H. Curran H. B. Weiss J. L. Horsfall

The resignations of Dr. O. A. Johannsen and Mrs. Alan S. Nicolay from the Society were accepted with regrets.

The Librarian submitted his report on accessions to the Library of the Society. It was placed on file.

Dr. Ruckes spoke of the meloid beetle, *Cystodemus wislizeni,* which is found in the dry areas of New Mexico with a physiological adaptation for the heat and dryness of the climate. The elytra are folded in a tent over the body to give ventilation.

The following were proposed for membership in the Society: Mr. Clayton M. Cook, 23 West 70th Street, New York City; James M. Leonard, 15 Minetta Street, New York City.

Dr. Roland F. Hussey then presented the paper of the evening, "Collecting Insects in Paraguay," which was an interesting account of his travels and collecting experiences in this country.

The party, consisting of Dr. and Mrs. Hussey and Dr. Donald Wees, left New York early in September, 1931, with the intention of doing zoological reconnaissance work in the Chaco, in a region lying on the Paraguayan-Argentine boundary about 200 km. west of the Paraguay River. The particular objective of the party was the Estero de Patiño, a great swamp about 70 km. in length, which interrupts the course of the River Pilcomayo.

On arriving in Buenos Aires, Dr. Hussey was advised strongly against attempting to work in that part of the Chaco, as it had been made a military zone and was within the scene of action in the hostilities between Paraguay and Bolivia. When the party reached Asuncion in mid-October, the flooded conditions of the Chaco, and the threats of still higher water, when the rainy season arrived, precluded the possibility of working in the Pilcomayo district, and accordingly the program was changed and work was undertaken in the east central part of Paraguay.

The first field work was done in Colonia Independencia, a homestead colony located about 30 km. northeast of Villarrica, and it was here that Dr. Hussey found conditions for entomological work the best that he encountered in Paraguay. The seasonal distribution of insects is very strongly marked, and at this time (October 25 to November 15) the spring was not so far advanced as to reduce the number of forms very materially. This was a district characterized by broad flat *campos*, surrounded by gently rolling land which was unusually heavily forested; and it was upon the higher ground that the homesteads were cut out of the forest and planted with a variety of crops and subtropical fruits. Dr. Hussey commented on the fact that apparently there were very few insect pests affecting these crops, the notable exceptions being the ever present Attine ants and the abundant *Dysdercus ruficollis*, which in some places is a serious cotton pest. The native food plant of the latter is *Sida rhombifolia*, an abundant and wide-spread weed which, like the cotton plant, is of the family Malvaceae.

From Colonia Independencia, the party moved north-east, stopping for a few days at Colonia Troche, to a large ranch located about ten miles from the village of Caaguazu. This lies east of the watershed and the drainage is to the Paraná: the district is one of green rolling plains and large areas of heavy forest, always on the higher ground. On the plains there are scattered trees of a dwarf palm, *Cocos yatai*, and less frequent low trees of a Euphorbiaceous species, *Sapium haematospermum*. The latter is the food plant of a remarkable Scutellerid bug, *Pachycoris torridus* which, like its Central American and Antillean Congeners, furnishes the only example of maternal solicitude displayed by any American Heteroptera, in which the female stands over the egg mass until the young emerge, and sometimes even until after their first moult. This plant also has a certain species of Coreid identified with it, whose dark brown eggs are inserted singly into the tissues of the seed covering.

Conditions for entomological work in this region proved most disappointing. The preceding winter had been cold, with several snow falls; the spring had been cold and wet; and from the time of the party's arrival the weather turned dry and hot. Thunder showers passed almost daily, at a considerable distance, but seemed to avoid the particular region where Dr. Hussey was working. The plains yielded few insects other than orthoptera, ants, termites, and predatory diptera and hymenoptera. Lumbering operations in this vicinity had been discontinued because of the depression, and there was no opportunity to collect any tree-top forms. Collecting at light was very poor, and formed a striking contrast with conditions as described for other years. Certain Leguminosæ, notably Acacias and Mimosas, yielded a fair variety of insects, but the plant which seemed to have the greatest variety of insects was the "Caa-ô-beti" (*Solanum verbascifolium*), a small slender tree which Dr. Hussey described as ecologically equivalent in the Paraguayan flora to the sumac in ours. The insect fauna of this plant is most varied, but the various individual plants rarely show any considerable number of different species. Thus one may

have a number of large Meloid beetles, another may yield a dozen of the large *Edessa rufomarginata,* a third may have specimens of the curious Pentatomid *Dryptocephala punctata* half hidden under its closely appressed leaves.

Dr. Hussey also spoke of meeting several entomologists in the course of his travels, notably Dr. Carlos Bruch, now living in retirement near Buenos Aires after many years of service in the La Plata Museum; Messrs. Adolfo and Alberta Breyer, possessors of noteworthy collections of Argentine Coleoptera and Lepidoptera, and leaders in the Argentine Entomological Society; Mr. Heywood, curator of the Breyer collections and collector extraordinary of Argentine insects; Mr. Pedro Jorgensen, of Villarrica, Paraguay, and several others. He also commented on the insect collections in the museums in Buenos Aires and La Plata, referring particularly to the La Plata collection, which contains the specimens studied by Carlos Berg, pioneer in the Hemipterology of Argentina.

Dr. Lutz said that, whereas Dozier had observed female fulgorids showing maternal solicitude in hovering aaround the eggs which they had deposited, he wondered if this were not a case of the mother bug being too lazy to move on after depositing her eggs.

ELIZABETH SHERMAN, *Secretary*

MEETING OF JANUARY 17, 1933

A regular meeting of the New York Entomological Society was held on January 17 in the American Museum of Natural History; President Ernest L. Bell in the chair, with twenty-two members and nineteen visitors present.

The annual report of the treasurer was received and ordered placed on file. Mr. Bell stated that he had examined the treasurer's report and found it to be correct.

Mr. Clayton M. Cook and Mr. James M. Leonard, proposed for membership at the previous meeting, were duly elected members of the Society.

Mr. F. L. Fillion, a charter member, was made a life member of the Society, and the Secretary was directed to notify him of this fact.

A motion proposed by the executive committee with regard to members whose dues are in arrears was carried and the treasurer was directed to notify such members accordingly.

Dr. Lutz exhibited wings of butterflies shown between two sheets of lantern slide glass, bound by strips of bristol board impregnated with celluloid and acetone, making the specimens mould-proof and pest-proof—the name label being similarly treated and thus made permanent. He had devised this method for preparing an identification collection needed at Barro Colorado Island, but said he would like very much to have other suggestions, mentioning as one objection that the preparation of each mount of this kind took him about two hours.

Dr. Lutz then delivered the paper of the evening by Mr. Richard Burlingame and himself on "Ultraviolet Lepidoptera," indicating that these

insects are not seen by one another as human beings see them. Charts of the various octaves of sound, heat, and light waves were shown, together with several cases of Lepidoptera, and also black and white photographs taken with a G 586 filter of the ultraviolet colors and patterns of these insects. Various experiments made and cited showed all insects sensitive to ultraviolet with reactions indicating that they could *see* it. Dr. Lutz mentioned Lubbock's experiments with ants, in 1879, showing them to be blind to red, or color-blind to colors as we know them, and cited the more recent experiments of various German students showing insects to be attracted by ultraviolet, whether food was offered or not.

Dr. Lutz afterwards spoke on "Diurnal Rhythm of Orthopteran Activity" exhibiting the apparatus used in his experiments, together with various charts of the activity of these insects both under normal conditions, and also when constant darkness, or constant light was imposed. Even under abnormal conditions the insects after a while adapted their activity to a diurnal rhythm, showing maximum activity at regular intervals. Similar experiments by German students with the honey-bee, were mentioned by Dr. Lutz.

This paper was discussed by Dr. Ruckes who called attention to Hingston's book "Instinct and Intelligence" illustrating the inflexibility of instinct.

Mr. Sanders was interested in the economic possibilities in the use of ultraviolet lamps as traps, but their cost of maintenance was considered to be prohibitive, and their use as likely to destroy not only injurious insects, but useful ones as well.

JOHN D. SHERMAN, JR., *Secretary—Pro tem.*

MEETING OF FEBRUARY 7, 1933

A regular meeting of the Society was held on February 7, 1933, in the American Museum of Natural History; President Ernest L. Bell in the chair with twenty-two members and twenty-three visitors present.

It was duly moved and seconded that the by-laws be suspended and the first meeting in March be held on the second Tuesday instead of on the first Tuesday of the month. This change will enable Dr. C. T. Brues to address the Society on "Our Changing Insect Population."

Mr. Harry Stiner of The National Biscuit Company, 85 Ninth Avenue, New York City, was proposed for membership in the Society.

The resignation of Mr. George B. Wilmott, 155 Prospect Avenue, Staten Island, New York, was accepted with regret.

A communication from the Entomological Society of London was read inviting the New York Entomological Society to take part in the celebration of the first hundred years of the existence of the London society to be held on the 3rd and 4th of May, 1933.

On motion, the secretary was instructed to send greetings to the Entomological Society of London and an appreciation of the honour in being invited to attend the celebration of its centenary, and stating that in the

event any members do attend these meetings in May they will be duly appointed as delegates for the occasion.

Mr. Wurster exhibited a specimen of *Telea polyphemous* (Cramer), described in the Bulletin of the Brooklyn Entomological Society, Vol. XXV, No. 5, pp. 273–275, as a new aberration, differing from the normal in having a large portion of the ground color of all the wings, above and below, black or blackish. He proposed the name *Telea polyphemous ab. fumosus* n. ab. for this melanic form.

Dr. James P. Chapin gave the address of the evening, "Insects as a Diversion in the Congo," illustrated by lantern slides. Dr. Chapin modestly gave Herbert Lang the credit for the great number of insects that were collected on their expedition to the Belgian Congo, 1909–1915. He, also, mentioned their good fortune in having the backing of Dr. Schouteden of Tervueren, Belgium, and also their indebtedness to Dr. J. Bequaert whom they met late in their expedition, but who rendered them invaluable entomological service as an authority on the zoology of the Congo. Among the many interesting facts and experiences that Dr. Chapin related were the activities of the driver ants, *Dorylus* (*Anomma*) *nigricans* Illiger, which are a hundred and one per cent courageous, travel in columns, and swarm over everything; the Love Birds and the African doormouse which live in the holes made by the small woodpeckers in termite nests; the termite "pagodas" and larger mounds, in which there are chambers of fungous gardens (the termites feed on the fungus buds); the edibility of termites, which have a nutty taste, even though they may be a little gritty because of the mandibles; the larvæ of a bot-fly which is found in tunnels on the elephant's foot—under a pressure of one ton to each foot; and the grey cloud of geometrid moths which was seen in the Alpine zone of the Ruwenzori Mountain. The white cattle herons which walk with sheep in the morning "as if they had a real fondness for their society," the wagtails which prey on butterflies (they shake off the wings then swallow the body), and the European white stork, which has a great fondness for grasshoppers were some of the bird-entomologists described by Dr. Chapin. Besides his many fine slides, Dr. Chapin showed many specimens and exhibits pertaining to his travels in the Belgian Congo.

Mr. Davis exhibited some exceptional and butterfly-like Cicadas.

ELIZABETH SHERMAN, *Secretary.*

MEETING OF FEBRUARY 21, 1933

A regular meeting of the Society was held on February 21, 1933, in the American Museum of Natural History; President Ernest L. Bell was in the chair, with twenty-two members and twenty-six visitors present.

On motion, it was voted that the secretary cast a ballot electing Mr. Harry Stiner a member of the Society.

Dr. Herbert Ruckes delivered a most interesting and edifying talk on "The Biology of South-Western Insects," illustrating his remarks with slides, some colored, and with motion pictures. An abstract of his talk appears, as follows:

New Mexico is approximately 400 miles long by 380 miles wide, equal in area to about New England, New York, Pennsylvania, and New Jersey. Northerly, it lies next to Colorado; southerly, it abuts on the northern limit of Mexico. Within these boundaries lie five of the six life zones of the Southwest. Three rivers pass vertically through the state. Near the eastern border lies the Pecos. Through the central part extends the Rio Grande. On the western border extends the Gila. Extending from south to north along the valleys of these rivers, we find the zone called the Lower Sonoran. Directly northwards of the Lower Sonoran is a very expansive, arid desert region known as the Upper Sonoran. Together these two life zones form at least 2/3 of the area of the state. Following these in turn are the Transitional Zone, then the Canadian, the Hudsonian, and in two or three instances, we have evidences of the Alpine.

The Lower Sonoran Zone extends in altitude from about 2500′ to 3500′ elevation, or, from the international border to the town of Hot Springs. The Upper Sonoran Zone, starting about the 3500′ elevation extends approximately to 7000′, or, from the town of Hot Springs to the city of Santa Fe. The Transitional Zone the extends from 7000′ to about 8500′; the Canadian from 8500′ to 9500′; the Hudsonian Zone from 9500′ to about 12,000′. Where the mountain peaks rise higher than 12,000′, in two or three localities, evidences of Alpine life are visible.

The mountain system of the state belongs to the lower foothills of the Rockies, and is a continuation of the mountainous area of northern Mexico.

The rainfall of the state as a whole, based on the observations of the last 50 years, is about 10 inches per annum. In certain areas of the Upper Sonoran Zone, the rainfall is less than three inches per annum; while in the higher mountain ranges, it may reach as much as 24 or 25 inches. Obviously, these control the type of vegetation and animal life in these different parts of the state.

The fauna and flora of the Lower Sonoran and Upper Sonoran regions are similar to those of the lowlands and highlands of northern Mexico. The dominant plants of the region, cactus and mesquite and greasewood, are in each instance, either succulent or leafless and spiny. Insects are relatively few in numbers in these areas due to the lack of moisture. The Upper Sonoran Zone, in addition, has an abundance of piñon pine and juniper, with bees the most abundant type of insects visiting the small abortive flowers that occur on these deserts. The richest vegetation and insect life are found in the cooler and wetter mountain regions. No less than 3000 species of plants have been collected from the mountain ranges. Most of these are similar to the plants of Colorado, Utah, and Wyoming.

Wherever waterways occur, and these are few and far between, insect life rises to its height. The poorest represented orders of insects are the mayflies, dragonflies, and other deeply aquatic forms. Butterflies and moths are particularly abundant in the Canadian Zone; while beetles extend well down into the Upper Sonoran region.

Extensive collecting was carried on during the trip, which covered 13,000 miles of road within the state.

Dr. William S. Creighton then spoke on "Collecting Insects in the Southwest." Using colored slides, he described his travels through the spectacular scenery of Colorado and Utah, the fantastic formations of Bryce Canyon National Park, the many insects that were crowded into the flat sections at the bottom of the canyon of Zion National Park, the big trees of Sequoia National Park, and the immense scope of the valley of the Yosemite. In Arizona, the Wachucha Mountains offer great entomological possibilities, as

does the Kaibab region on the rim of the Grand Canyon and the Grand Canyon itself. Dr. Creighton expressed the hope that his remarks and pictures would arouse interest among entomologists to do more extensive collecting in this, the Southwest, region of the United States.

ELIZABETH SHERMAN, *Secretary.*

MEETING OF MARCH 14, 1933

A regular meeting of the Society, postponed from March 7, was held at the American Museum of Natural History on March 14, 1933; with President Ernest L. Bell in the chair and eighteen members and twenty-six visitors present.

Mr. F. E. Church of 655 Park Avenue, New York City, and Mr. Frank A. Soraci, 314 Verona Avenue, Newark, New Jersey, were proposed for membership in the Society.

The resignation of Philip Dowell was accepted with regret.

A letter from Miss Lillian Leale stated that her father, Dr. Chas. A. Leale, a member of the Society died in June, 1932. The secretary was directed to send a letter of condolence to Miss Leale.

On motion of Mr. C. H. Curran the secretary *pro tem* was directed to convey to Miss Elizabeth Sherman, the secretary, the best wishes of the Society and hopes for her complete recovery and renewed attendance at the meetings at an early date.

Dr. A. L. Melander delivered a paper on "Some Fossil Insects" with several lantern slides showing various specimens, mostly from Mazon Creek, Illinois, contained in the collection of the University of Chicago, and also hypothetical and synthetic restorations of fossil insects by Handlirsch and others. Charts showing the Handlirsch scheme of the ancestry and classification of insects were distributed to those present. Dr. Melander stated that the earliest animals lived in water and mud, and that their first successors were amphibious or shore forms. The first terrestial arthropods were trilobites and scorpions (modified trilobites), arachnids and millipeds. The first spiders had segmented abdomens. The earliest insects appeared in the Carboniferous Age constituting an Order no longer existent, named Palaeodictyoptera. These Insects had the legs bent forward and the hind wings were identical with the fore wings: lobes at the side of the body were commonly present. In the Palaeozoic era various distinct Orders of Insects appeared. Protorthoptera, Protoblattoide—the very abundant prototypes of our present cockroaches, Protodonata—the prehistoric dragonflies, some very large with a wingspread of 20″, Protoephemerodea—ancient mayflies with enormous hind wings, Protocoleoptera with distinct venation of the elytra, etc. The closest analogy to existing insects is found in the Protoblattoidea. Dr. Melander does not believe the wingless specimens of the Devonian Age to be insects: some have considered them as fossil Thysanura.

Dr. C. T. Brues then spoke on "Our Changing Insect Population," illustrating his remarks with slides, charts and motion pictures. While admitting the present very great importance of the insects, he thinks that this

is perhaps only a passing phenomenon. Insects found imbedded in the resin of turpentine trees in pine forests of Florida suggested to him a comparison of such forms with those of the fauna of the Eocene Age found imbedded in the amber deposits of N. W. Europe in the region of the Baltic Sea. Amber is fossilized resin, very much hardened, and the insects found in it are the best representatives of fossil insects which exist. These fossil insects of the Eocene Age, 60,000,000 years or so ago, found in the amber deposits of N. W. Europe find their nearest living relatives in the present Nearctic Fauna. Ulmer working on the caddis flies of the amber was able to figure out what the terrain of these ancient forests was probably like, and his verdict suggested a close resemblance to the present hilly forests of New England, and acting on these ideas, Dr. and Mrs. Brues, from early May to late September, 1930, made a census of the insects taken in tanglefoot fly-paper around their home at Petersham, Mass., at an altitude of 800–1100 feet where the ecological conditions coincide with Ulmer's hypothetical Eocene amber terrain. The bands of tanglefoot were placed on three trunks at various heights in the Petersham forests. Tanglefoot takes the place of amber admirably trapping the insects just as resin did in the Eocene Age. The specimens caught were readily released upon immersing the tanglefoot in 95% alcohol. Over 21,000 insects were trapped, with a great preponderance of Diptera. Comparing these insects with a large number of amber insects it was noted that Parasitic Hymenoptera of the amber fauna were more diversified than in the Petersham collection, and Ichneumonidae and Platygastridae are relatively far more abundant at the present time, while the Braconidae and Scelionidae are much less abundant than in the Eocene era. Ants show a great decrease now, but it is possible that a similar tanglefoot census made in Australia would not confirm this decrease. In the Coleoptera, 62 families are represented in the amber collections, only 39 in the tanglefoot; diversification occurred much earlier in geological periods, among the Coleoptera than in other orders. The Diptera have shown a great increase in numbers and in diversity since the amber days, and especially in the family Phoridæ the great diversity shows that these insects are in an active state of evolution. 6,040 of the tanglefoot collection were Phoridae, far exceeding all other groups of insects: 3,070 were Dolichopodidae.

Dr. Brues suggested that as the primitive forms, especially in the Parasitic Hymenoptera, were more diversified, and as the more specialized types have increased, perhaps insects are no longer increasing in importance, and that a crisis of Insect Dominance may not really impend.

At the conclusion of Dr. Brues remarks a motion-picture reel was run showing the method of making the tanglefoot census at Petersham.

Mr. Curran stated that the Baltic amber flies were mostly Dolichopodidae, some of the species being still in existence in Europe: many of the amber specimens are better preserved than the pinned or slide specimens of present collectors.

JOHN D. SHERMAN, JR., *Secretary—Pro tem.*

MEETING OF MARCH 21, 1933

A regular meeting of the New York Entomological Society was held at the American Museum of Natural History Tuesday evening, March 21, 1933, with President Ernest L. Bell in the chair and fifteen members and fourteen visitors present.

Mr. F. E. Church and Mr. Frank A. Soraci were elected members of the Society.

Mr. H. C. Hallock spoke on "Methods of Studying Asiatic Beetles in New York," his remarks referring almost exclusively to the Oriental beetle, *Anomala orientalis*, not very injurious, except as a grub when it causes great injury to lawns and strawberry beds, and especially to the Asiatic Garden Beetle, *Autoserica castanea*. These species were first found in the United States in 1920 and 1921. Several slides were exhibited showing the insects, various types of injury to roots, leaves, blossoms and sod, caused by the beetles, as well as traps and breeding cages and charts. The Asiatic garden beetle does by far the greatest injury, feeding extensively in the adult stage on a great variety of ornamental plants. At Westbury and Jericho, L. I., this species is strongly attracted to electric lights on warm nights: on one occasion 21,000 specimens have been taken in a single trap on one night. On cold nights the beetles feed near the ground and do not fly to lights. Bred in cages at a temperature of 81°–82° Fahr., the beetle has a life cycle of some 80–90 days. In the cages many of the larvae are killed by mites.

Mr. Hallock's paper and various methods of control were discussed by Mr. Sanders, Mr. Horsfall and Mr. Curran; and President Bell expressed particular resentment over the destruction of his chrysanthemums at Flushing, by the beetle.

JOHN D. SHERMAN, JR., *Secretary—Pro tem.*

MEETING OF APRIL 4, 1933

A regular meeting of the New York Entomological Society was held at the American Museum of National History Tuesday evening, April 4, 1933, with President Ernest L. Bell in the chair and nineteen members and seven visitors present.

Mr. Curran exhibited Dr. Howard's new book, "Fighting the Insects: the Story of an Entomologist," calling attention to its many fascinating features and characterizing it as the Life History of an entomologist, who has always been a person of dominant charm, told it converstional style with a veritable treasure trove of interesting anecdotes.

Dr. A. L. Melander then spoke on "Life Zones in Washington State," mentioning the various factors of temperature, climate, soil, altitude, rainfall, amount of sunshine which are taken into consideration in determining what biologists call a Life Zone, a term including both animal life and plant life. Mention was made of the especially intensive study of these zones in North America, beginning with Merriam. The various regions of

the state of Washington were described and illustrated by numerous fine photographs and lantern slides representing both scenery and plants and insects. The lofty mountains of the Western Coast, permanently snow-capped and reaching an altitude of 14,400 feet, offer a great contrast to the Eastern United States, and their Alpine Gardens are very different from those of Mt. Washington, N. H., where the flowers are all white instead of brilliantly colored as in the West. The heavy forests and enormous annual rainfall of 12 feet in the Olympic Peninsula, and the lack of deciduous trees were commented upon, and the fine collecting in the Puget Sound region. Dr. Melander described the method by which certain large, very active syrphid flies frequenting squaw grass were taken; two persons each armed with a net operating at different blossoms far apart: eventually one person or the other might secure the fly sought for. Rubbing liver over trees to keep off Chrysobothris beetles was useful but the coyotes damaged the trees in eating off the liver applications. Earwigs overrun the Western Pacific Coast: they came from Holland with shipments of bulbs some 20 years ago and are now more ubiquitous by far than cockroaches here, swarming in automobiles and everywhere. Many and expensive attempts have been made to control them, but all have been in vain. The Coulee cricket was described and well illustrated as a very spectacular insect. Periodically there are great outbreaks of this wingless locustid, as huge armies migrate slowly but persistently from the sage brush areas, into the agricultural regions. There was a great outbreak in 1917, when 50 miles of fencing and ditching, subsidized by the nation and state when wheat was worth something, were constructed to save the wheat districts.

Mr. Engelhardt expressed his especial interest in the arid region of the state, which he hopes to visit this summer in quest if Sesiidae and their life histories. Dr. Melander apologetically confessed his personal appraisal of Lepidoptera as too messy to interest him.

JOHN D. SHERMAN, JR., *Secretary—Pro tem.*

MEETING OF APRIL 18, 1933

A regular meeting of the New York Entomological Society was held at the American Museum of Natural History Tuesday evening, April 18th, 1933, with President Ernest L. Bell in the chair and twenty-three members and thirty-one visitors present.

Dr. F. E. Lutz spoke on his recent experiments with bees, during a stay of about four weeks in Panama, to determine whether these bees could distinguish ultraviolet. He gave a summary of various experiments along this line during the last ten or eleven years conducted by Dr. Richtmeyer and himself in Colorado, by Dr. von Frisch in Munich, and others, including his own recent work as presented at Atlantic City in 1932. The bees tested in Panama were stingless honey-bees of the family Meliponidae, genus Trigona, a group of social bees common in the tropics and in Panama. Cards with various patterns of Chinese white, which did not reflect ultraviolet color, and velvet white, which did reflect it, were used. The bees would not

come to any sweetened baits, as did the domestic honey bees to Dr. von Frisch's baits, but a colony of the bees fortunately happened to be established in the wall at one side of the laboratory building and the decoy cards were placed in the vicinity of the entrance to this nest, in various positions. The tests were made in good sunlight and despite all temptations, the bees by a great preponderance of evidence showed their ability to distinguish white reflecting ultraviolet from white which did not reflect this color. Dr. Lutz while in Panama experimented also with ants but postponed his remarks on these insects until a later date. The full results of Dr. Lutz's investigations will be published by the American Museum of Natural History.

Dr. H. W. Stunkard of New York University then spoke on "Protozoa that Live in Insects" mentioning the various groups of protozoa and commenting on the literature and work of various students. He recommended especially Wenyon's "Protozoology" in two volumes and "Problems and Methods of Research in Protozoology" by Hegner and Adams. He stated that the study of Protozoology thus far has been practically limited to those aspects which affect man. The protozoa were originally free living organisms which at first became associated with other organisms and then developed their parasitic habits. All kinds of animals are parasitized by them but insects were evidently the primary hosts and through custom and adaptation are very little troubled by them. When organisms become parasitic, they become very prolific and various methods of reproduction occur. When the protozoa are transferred to a new host, especially if it is not related to the former host, they become very virulent and various diseases result.

Particular comment was made on recent studies of the protozoa of termites by Cleveland and Kirby and Kofoid. One hundred and ten species of flagellate protozoa parasitic on termites have been found: if these parasites are removed the termites die. Protozoa are also very common parasites of cockroaches, water striders, and insect larvae.

Dr. Stunkard's paper was discussed by Dr. Lutz who characterized termites as specialized social cockroaches, by Dr. Ruckes who mentioned that no protozoan parasites had so far been found in wood boring Coleoptera, by Mr. Curran, and others.

JOHN D. SHERMAN, JR., *Secretary—Pro tem.*

MEETING OF MAY 2, 1933

A regular meeting of the New York Entomological Society was held on May 2, 1933, in the American Museum of Natural History with President Ernest L. Bell in the chair and seventeen members and fifteen visitors present.

Mr. Curran introduced Mrs. Shore to the Society as the daughter of the late Dr. S. W. Williston. Twenty-five years ago, Dr. Williston published the third edition of his "Manual of Diptera." Today Mr. Curran is working on a revision of this Bible of Dipterologists. Wishing to obtain the original

drawings and cuts of the Manual, Mr. Curran appealed to Mrs. Williston and Mrs. Shore who have been very generous in allowing him to use those drawings and cuts which they found in their possession. Mr. Curran then gave a short history of Dr. Williston saying that he was originally interested in Coleoptera in Colorado, then became interested in Diptera while he was studying Paleontology. Mr. Curran then spoke very highly of Dr. Williston's work in Dipterology and gave tribute to him for his excellent though brief work in this field of Entomology.

Dr. Lutz then stated that the Exotic Diptera of Dr. Williston's collection are in the American Museum of Natural History. Dr. Lutz said that he, too, had been an ardent admirer of Dr. Williston ever since his acquaintance and association with him at the University of Chicago.

Dr. C. C. Hamilton of the New Jersey Agricultural Experiment Station delivered his paper on "Some Problems in the Control of Insects infesting Ornamental Plants." Because of the commercial importance of greenhouses, the greenhouse plants have received the most study and experimentation. The conditions and methods of control for outside flowering plants are entirely different from those found in the greenhouse. Likewise the insects infesting nursery plants and again those infesting shrubs and shade trees present entirely different problems. It has been found that those insects which have a limited number of host plants are difficult to work with. Also, most home owners lack the proper equipment to cope with insect infestation. Dr. Hamilton has been working on the control of Gladiolus thrips for the past year. These thrips appeared suddenly and have spread very rapidly. In speaking of the chemicals which had been used for control of the various thrip infestations, Dr. Hamilton stated that bichloride of mercury is most satisfactory when used as a dip and introduced into the spot where insect is feeding; Pyrethrum is not so satisfactory because it leaves no residue; hot water and nicotine or Pyrethrum dust are successful when handled carefully by an expert; Napthaline is also excellent when used in a closed container. For the control of thrips in the field, rotenone dusts which remain repellent for a period of a week have been found to be the most satisfactory. At present, the New Jersey Agricultural Experiment Station is trying to determine on a pine oil mixture which has a sufficient resinous base to retain nicotine resinate over a short period of time for the control of boring insects such as the Shot Hole Bark Borer type in dogwood and pin oak.

Dr. Horsfall, in answer to a question of Dr. Hamilton then spoke on the control of the European pine shoot moth. By spraying into the wind with a nicotine and penetrol spray after the moths had emerged June 1 to June 15, it was possible to reduce the infestation from clouds of the insects before the first spray to very rare occurrences after the third spray.

In answer to a question by Dr. Felt, Dr. Hamilton stated that a rotenone spray is effective as a stomach poison for one week.

Dr. Felt spoke on the literature on shade trees and ornamental plant infestations by Gregory and Davis and by Andrew Wilson saying that a

great many problems still remained to be solved in this field of ornamental plant infestation. It is necessary to make spray tolerance tests not only for the special host plant in question but also for those plants that may be found in the vicinity of this host plant.

ELIZABETH SHERMAN, *Secretary.*

MEETING OF MAY 16, 1933

A regular meeting of the Society was held on May 16, 1933, at 8:15 o'clock in the American Museum of Natural History, with President Ernest L. Bell in the chair and sixteen members and nineteen visitors present.

Dr. E. D. Wilson of 72 Pine Brook Drive, Larchmont, New York, was proposed for membership in the Society. The by-laws were suspended and Dr. Wilson was elected.

Dr. George E. Sanders read a paper on the "Abundance and Distribution of Termites in the New York Region." An abstract follows:

THE ABUNDANCE AND DISTRIBUTION OF TERMITES IN THE NEW YORK REGION

BY GEORGE E. SANDERS

The termite in the district about New York City and North has only recently become a serious pest. This year we hear of probably three times more houses infested by them than last year. Last year about three times more than the previous year. As I understand it damage up to two or three years ago was rare. Termites were here previously but not a common nuisance, and I find from records that termites were doing some damage in Massachusetts in 1870. Strangely enough the old records mostly cite them as greenhouse pests damaging geraniums and similar plants. They are recorded as doing damage in Manchester, New Hampshire, in 1903. Possibly the termite is a native insect in this territory. However, damage from them in appreciable amounts is very recent. Why they are doing so much more damage now than previously is not clear. It may be that the past few seasons have been particularly moderate, but we have had periods of warm seasons before. It has been suggested that heated houses is the cause, but we have had heated houses for a long time and, more than that, the most severe outbreak of all, in this vicinity is in poles, out of doors.

I remember some twenty-five years ago I was working on June beetles and white grubs in Illinois. In fourteen years collecting only two adult June beetles had been taken on corn. Tens of thousands of specimens had been taken from various trees and classified. Common among them was *Lachnosterna gibbosa,* found as an adult feeding mostly on willow. One day we got a call that a field of corn then about ten inches high was being devoured by some unknown insect. I visited the field and found nothing on the plants, the leaves badly eaten and plenty of *Lachnosterna gibbosa* in the ground. John J. Davis and I arranged to visit the field that night. If I remember rightly that visit showed two to three *Lachnosterna gibbosa* to each hill, feeding freely on the corn leaves, the first and only record of an

adult June beetle eating corn or any other grass plant. That particular field was almost destroyed by that freak strain of *Lachnosterna gibbosa* that had adapted itself to it. It may be that some freak strain of termites similar to that freak strain of Lachnosterna is the cause of this outbreak.

It may be that unusual transportation facilities are the cause of the termite now doing so much more damage. Colonies transported from one locality to another and perhaps distantly strains of the species crossing and resulting in a strain more vigorous than either of the parent strains. The reason for the unusual outbreak, which promises to last a number of years if not permanently, is all guess work. The fact remains that we have termites more active and doing more damage than ever before in this area.

The only termite recorded from this locality is *Reticulitermes flavipes* Kollar. It seems now so wide spread and to have adapted itself to so many different conditions that I look for it to become a more and more serious pest as times goes on, until possibly some of the natural enemies adapt themselves more to it.

We know of severe outbreaks at the present time in every section about New York City. A row of houses in Westchester County, a Courthouse. Several dwellings in Northern New Jersey. A theatre near 42nd and Broadway. A building in downtown New York, several houses in Brooklyn and Queens. On the east end of Long Island we found them very numerous; every dead piece of wood over an area of four square miles seemed infested. The ground seemed almost alive with them.

In some cases serious damage has already resulted, requiring the replacement of timber. In one case the house was built on a concrete wall seven feet high and the nests were under the cellar floor. The tunnels were built up the entire height of the wall and the sills and joists damaged badly. The owner said the tunnels had been brushed down from time to time, but that the termites would rebuild them in about two weeks.

A ship was recently in port, the topwork of which was badly infested by a dry wood termite. I do not know the species. Without doubt the dry wood termite has been repeatedly introduced here on ships. We have no record of dry wood termites having established themselves in this area. However, from descriptions of two outbreaks I have reason to suspect that some species of dry wood termite is present here. One case is described as a house on a poured concrete foundation. Some of the timbers are eaten to tinder. No trace of any tunnels. Another case; serious damage to the woodwork around a third story window. No evidence of termite injury lower down in the building. I am inclined to suspect dry wood termites in both cases. Undoubtedly they have been introduced here many times as the evidence from the ship indicates yet they are not recorded so far as I know north of Norfolk, Va. We hope in a short time to determine whether the two outbreaks that we suspect are dry wood termites or not.

Until we are sure that the dry wood and moist wood termites are not es-

tablished in this area it might be wise to treat ships, known to be infested by either of the two forms, entering these ports. We know that some of them in the west extend as far north as Montana, and some of the species, not now here, could easily become established here.

We know that *Reticulitermes flavipes* Kollar extends as far north as the border of Maine and has been found doing damage at Albany, N. Y., and Manchester N. H. The most northerly serious outbreak that I have come in contact with is in Wellesley, Mass., where one of the College buildings is seriously damaged.

So far as natural enemies are concerned we have found no fungous diseases attacking them. We have found two species of ants attacking them and apparently cleaning out the colonies. We have found *Cremastogaster lineolata* cleaning up termite colonies and then proceeding to continue the damage to the wood in which the termites were living. We have also found a yellow ant, that I used to know, cleaning up a termite colony. This ant I am quite sure will not attack the wood.

As I said before, why the termite has not damaged property here before, or why it is becoming epidemic now, is not at all clear. I am sure that we could get records of upwards of 100 outbreaks in and around New York at the present moment that are under treatment of one sort or another. Naturally that is only a fraction of the colonies that are damaging buildings. In most cases the owners do not recognize them. They are just flying ants. The termite situation here looks like a repetition of what has just occurred in California. Termites had been recorded from California for years but the first real damage occurred in 1926 when the Public Library in Pasadena was attacked. Now the damage is state-wide and is costing California property owners hundreds of thousands annually. The construction of new buildings there has been changed and buildings made termite proof when erected. Without doubt builders in this locality will have to follow suit and erect termite proof buildings.

It may interest you to know that the damage to wooden buildings by termites in termite areas is estimated at one percent per year. The annual damage to farm buildings in the South is estimated at $29,000,000 per year.

A recent federal publication estimates the cost of treating and termite proofing an infested dwelling house at from $500.00 to $2,000.00, whereas the cost of making the same building termite proof when erected would only amount to an additional cost of from $50.00 to $100.00.

In some countries notably in Hawaii, a man whose property is made or built termite proof can get larger loans on his property or his loans at a lower rate of interest than the man whose property is subject to termite attack. This angle of the termite problem has not yet been considered in this area by our banks and money loaning institutions.

Last year Mr. Durling and I estimated that by 1934 termites would begin to be a real problem in and about New York. They seem more serious now than we expected them to be by 1934. They are present in every section in and around the City and every building with wooden construction within at

least seven feet of the ground is susceptible to attack. Their damage has already been severe enough in many buildings to necessitate the replacement of timbers. So far no buildings have collapsed from termite injury about New York, as they did in California before owners became acquainted with the termite and learned to apply control measures before the damage was beyond repair.

In California termite control operators are all controlled as are tree surgeons, commercial sprayers, etc., by the state through the County Agricultural Commissioner. So much fake work was being done by incompetent operators in the early stages of the Californian outbreak that this system of regulation became necessary in order to protect the public.

Control: Real control, of course, means buildings made termite proof when erected, either the timbers treated or the basement walls arranged so that termites cannot pass to the wooden superstructure above. Sometimes a sheet of metal is used as a barrier. Recently the Pyrex glass people produced a glass brick intended for use on the top of the wall and below the sill. The idea being that the termite would not build a tunnel over the light transmitting glass. The perfect termite remedy is yet to be discovered. It may be a poisonous material volatile at 150 F or thereabouts. It may be a poison in solution and more penetrating than anything we have yet seen. It may be something harmless to man and toxic to protozoa which will kill only the protozoa in the intestines of the termite, and then, of course, starve the termite to death, in the midst of plenty of food and with its stomach full. This of course sounds fantastic but is possible and even probable.

At the present time the operator must look the outbreak over, (each outbreak is different from the next) and select from the list of chemicals the poison or poisons that can best be used in that particular location with regard to the cinstruction of the building, the comfort of the inhabitants safety of nearby trees or shrubs, the location of the colony, etc. Then the operator chooses from Paris Green, Cyanide, Petroleum, paradichlorbenzene, orthodichlorbenzene, arsenite of soda, white arsenic, soda ash, copper sulphate, beta naphthol, kerosene, crank case oil, gasoline, rotenone, sodium fluoride, sodium silicofluoride, zinc chloride, zinc arsenite, sodium arsenate, creosote, borax, magnesium fluosilicate, copper fluosilicate, benzol, carbon tetrachloride oil emulsions, chlorinated naphthalene, carbolic acid, cresylic acid, mercuric chloride, sodium dinitrophenilate, coal tar, wood tar, carbon bisulphide, etc., etc., the chemicals he thinks best adapted for that particular piece of work. All of the chemicals mentioned and many more have been and are now in successful use in one place or another in termite control work, the operators adapting them to conditions and equipment.

Every termite outbreak is a separate and distinct problem and no two of them are alike, so it is impossible to lay out any system of treating, without first examining the particular outbreak to be treated.

A symposium on termites followed this very interesting paper. Dr. Lutz, Dr. Bromley, Mr. Curran, Dr. Horsfall, Mr. Davis, and others took part in this discussion. The Society was honored by the presence of the Reverend

Doctor Assmuth, from Fordham University, an authority on termites both here and abroad, whose remarks, both scientific and humorous, added a great deal to the interest of this meeting. The possibility that termites have become more noticeable in the past few years as a result of the layman becoming termite-conscious was discussed. It was felt, however, that the general movement of the termites from the tropics to northern climates was due to the fact that the heating of buildings has become so universal thus giving the insects a constant, warm temperature to live and work in. The sudden appearance of termite damage may be due and in most cases is due to several if not many years of infestation. Mr. R. M. Church, Vice-President of the American Wood Preserving Association, spoke of the necessity for making a fence against the termite and in this connection he suggested the use of metal shields to preserve wood in contact with the soil. Treating wood with creasote under pressure is found to be successful in this climate but in the tropics, the heat and torrential rains render even this treatment ineffectual. The Redwood of California is the only wood which has been found to be immune from termite attack. Extensive experiments with various woods are being conducted at Barro Colorado in the Canal Zone.

Mr. Curran spoke of the death of Norman Criddle, for many years an entomologist for the Canadian Government. Mr. Criddle was well known for his manufacture of a poison bait, known as the Criddle Mixture, for the extermination of grasshoppers in Manitoba. Mr. Curran expressed his deep regret at the loss of so fine an entomologist and one who was his personal friend.

ELIZABETH SHERMAN, *Secretary.*

FIVE NEW GENERA OF NEW ZEALAND AND MALAYAN OESTROIDEA

BY CHARLES H. T. TOWNSEND

In Mr. Malloch's Calyptr. Dipt. N. Z. VII and Dipt. Calyptr. Fed. Malay St. III, there are described five forms which are entitled to separate generic recognition, which is accorded in each case below.

Homohexamera gen. nov.
Genotype, *Protohystricia huttoni* Mh.–N. Z.

Belongs in Macromyini and differs from Hexamera BB. (syn. Photohystricia Mh.) by the long and slender proboscis, the haustellum being about as long as head height; and the atrophied palpi, which are reduced to tubercles. The remigium is posteriorly ciliate above, as in Hexamera.

Mallochomacquartia gen. nov.
Genotype, *Macquartia vexata* Hutt.–N. Z.

Belongs in Macquartiini and differs from Macquartia RD. by two ST, MM pair on first segment in both sexes, cheeks about as wide as eye length,